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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/929,359	08/15/2001	Tomaru Ogawa	50195-267	8872

7590

09/09/2003

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EXAMINER

DOVE, TRACY MAE

ART UNIT	PAPER NUMBER
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1745

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DATE MAILED: 09/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/929,359

Applicant(s)

OGAWA ET AL.

Examiner

Tracy Dove

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 and 17-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 and 17-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

This Office Action is in response to the communication filed on 8/7/03. Applicant's arguments have been considered, but are not persuasive. Claims 1-14 and 17-22 are pending. This Action is made **FINAL**, as necessitated by amendment.

Claim Objections

Claims 11-14 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The limitation "x stabilizes within $\pm 5\%$ " of claims 11-14 appears to broaden the scope of claim 3 and 4.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 11-14, 17 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 11-14 recite "'x stabilizes within $\pm 5\%$ ", which renders the claims indefinite. It is unclear what the formulas of claims 3 and 4 encompass if the composition of x is "within $\pm 5\%$ " according to claims 11-14.

Claims 17 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: the claims do not define "e" or "f".

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Furthermore, it appears that if “z is a substitution quantity” of M’ then the claims should recite a formula such as “ $\text{Li}_{1-x}\text{Mn}_{1-y-z}\text{M}'_{y-z}\text{M}''_z\text{O}_{2-\delta}$ ”.

To the extent the claims are understood in view of the 35 U.S.C. 112, 2nd, rejections and objection above, note the following prior art rejections.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-14 and 19-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Dahn et al., US 6,168,887 B1.

Dahn teaches a layered lithium manganese oxide material prepared as the cathode material in a lithium battery without rapid transformation to spinel. The layered lithium manganese oxide material has a reversible capacity in the range of 150-210 mAh/g (col. 2, lines 39-47). The lithium battery comprises the layered positive electrode material, a lithium negative electrode and an electrolyte (Example 4). Dahn teaches the layered positive active material is represented by the general formula $\text{Li}_x(\text{Mn}_{1-y}\text{M}_y)\text{O}_{2+z}$ wherein M may be a 3d transition metal such as Ni, Co, Fe, Cr or mixtures thereof; $0.5 < x < 1.3$; $0.0 \leq y < 0.4$; and $-0.5 < z < 0.5$ (col. 3, lines 25-45). Note col. 5, lines 56-67. Dahn teaches it has been shown that heavy chromium doping stabilizes the layered structure of a positive active material (col. 6, lines 50-55). See the

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Examples regarding claim 19. Dahn discloses $\text{Li}_{2/3}\text{MnO}_2$ in column 7, lines 41-42 and $\text{Li}_{2/3}\text{Mn}_{0.82}\text{Co}_{0.18}\text{O}_2$ in claim 13.

Regarding the limitation of a BOP of more than or equal to 0.23, Dahn inherently teaches this limitation because it is a property of the layered lithium manganese oxide material. Since Dahn teaches the same layered lithium manganese compound as discloses in the claimed invention, the compound of Dahn would inherently have the same properties (i.e., BOP value).

Thus the claims are anticipated.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dahn et al, US 6,168,887.

Dahn teaches a layered lithium manganese oxide material prepared as the cathode material in a lithium battery without rapid transformation to spinel. The layered lithium manganese oxide material has a reversible capacity in the range of 150-210 mAh/g (col. 2, lines 39-47). The lithium battery comprises the layered positive electrode material, a lithium negative electrode and an electrolyte (Example 4). Dahn teaches the layered positive active material is represented by the general formula $\text{Li}_x(\text{Mn}_{1-y}\text{M}_y)\text{O}_{2+z}$ wherein M may be a 3d transition metal such as Ni, Co, Fe, Cr or mixtures thereof; $0.5 < x < 1.3$; $0.0 \leq y < 0.4$; and $-0.5 < z < 0.5$ (col. 3, lines 25-45). Note col. 5, lines 56-67. Dahn teaches it has been shown that heavy chromium doping

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stabilizes the layered structure of a positive active material (col. 6, lines 50-55). See the Examples regarding claim 19. Dahn discloses $\text{Li}_{2/3}\text{MnO}_2$ in column 7, lines 41-42 and $\text{Li}_{2/3}\text{Mn}_{0.82}\text{Co}_{0.18}\text{O}_2$ in claim 13.

Regarding the limitation of a BOP of more than or equal to 0.23, Dahn inherently teaches this limitation because it is a property of the layered lithium manganese oxide material. Since Dahn teaches the same layered lithium manganese compound as discloses in the claimed invention, the compound of Dahn would inherently have the same properties (i.e., BOP value).

Dahn does not explicitly teach a specific example wherein M, in the formula $\text{Li}_x(\text{Mn}_{1-y}\text{M}_y)\text{O}_{2+z}$, is a combination of two metals.

However, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because Dahn teaches a general formula $\text{Li}_x(\text{Mn}_{1-y}\text{M}_y)\text{O}_{2+z}$ wherein M may be a 3d transition metals such as Ni, Co, Fe, Cr or mixtures thereof. Thus, Dahn provides motivation to use more than one transition metal for M by the teaching that “mixtures thereof” may be used. Furthermore, Dahn discloses $\text{Li}_{2/3}\text{MnO}_2$ in column 7, lines 41-42 and $\text{Li}_{2/3}\text{Mn}_{0.82}\text{Co}_{0.18}\text{O}_2$ in claim 13. Dahn has a specific teaching that chromium doping of the lithium manganese oxide material stabilizes the layered structure (col. 6, lines 51-55). Thus one of skill would be motivated to dope the $\text{Li}_{2/3}\text{MnO}_2$ or $\text{Li}_{2/3}\text{Mn}_{0.82}\text{Co}_{0.18}\text{O}_2$ of Dahn with chromium in order to stabilize the layered structure.

Response to Arguments

Applicant's arguments filed 8/7/03 have been fully considered but they are not persuasive.

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The 35 U.S.C. 102(b) rejection in view of Igawa has been withdrawn. The 35 U.S.C. 102(e) rejection in view of Nakano has been withdrawn. Both of these references teach doping the lithium with another element. The instant invention is directed toward producing a lithium deficient manganese oxide layered positive active material. The lithium deficiency of the present claims does not result from substitution with another element. Lithium manganese oxide layered positive active materials wherein the lithium occupied site has been substituted with another element are not encompassed by the instant claims.

Applicant argues Dahn fails to disclose the BOP value of the claimed invention. However, this limitation is a property of the claimed material. Since Dahn discloses the claimed material, Dahn inherently teaches the properties of the material.

The 35 U.S.C. 103(a) rejection over Igawa in view of Dahn has been withdrawn.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracy Dove whose telephone number is (703) 308-8821. The Examiner may normally be reached Monday-Thursday (9:00 AM-7:30 PM). My supervisor is Pat Ryan, who can be reached at (703) 308-2383. The Art Unit receptionist can be reached at (703) 308-0661 and the official fax numbers are 703-872-9310 (after non-final) and 703-872-9311 (after final).

September 6, 2003


Patrick Ryan
Supervisory Patent Examiner
Technology Center 1700